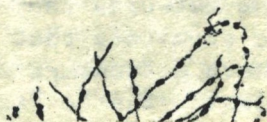
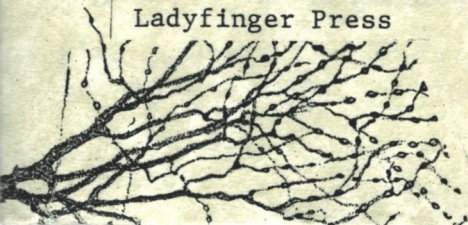


# The Brain, Pt 1

Introduction to  
Neuroconcepts  
as used in our  
Education Series



Ladyfinger Press



## 1. You

You perceive.

Perception isn't perfect,  
it's assembled. Our minds  
construct percepts.

Detection and perception  
flow as signals through  
our neurons.

How does a neuron work?  
It reaches out, repeats,  
and recalls.

How do neurons work in  
concert?

They fire together, and  
wire together.



## 2. Pruning

The neural landscape is made of connections.

Pruning is the management (selective elimination) of these connections as a person matures.

Over- and under-pruning can lead to, for example, autism.



### 3. Material

The Western tradition follows Descartes' dualism, which says there's something essential, ideal, and spiritual that makes up the mind (as opposed to the brain.)

Opposing this spiritual view is materialism, which could also be called a physicalism: meaning what's there is there, what's not is not, and the mind can be understood by looking at the physical matter of the brain.

## 4. Embodiment

When we look at the brain materially, we're led to look at it within the physicality of our bodies. Existing in and of a body, or embodiment, is part of a bundle called 4E cognition. They are:

- Embodiment
- Embedding
- Enaction
- Extension

The embodiment part may sound obvious, but it's taken a lot of incremental scholarship to get there.

## 5. Extension

4E's extended mind may seem to contradict the internalist feel of the material view: the thesis says the mind reaches out into the world, including and partly comprising the tools we use to help us plan and remember.

But there's no contradiction. The physical stuff of your brain doesn't natively distinguish between inside and out, self and other.

Environmental feedback is negotiated for this.




## 6. Feedback

Feedback governs the way we interpret reality--

whether it arises from our bodies or the world around us. When feedback tightly conforms to our intentions and predictions, we feel it as self-generated.

When it resists or surprises, it is cast as external, other. This divide gives rise to the boundary we call the self.

**Unfold and reverse  
this document  
to continue**



## 7. Predictive Processing

Experiencing what's outside, too, is a process of forming and satisfying predictions--and managing discrepancy when they're not met. This management of difference over repetitions makes up our everything.

As an exercise, try becoming aware of all kinds of predictions as you make them.



## 8. Enaction

In the West, we tend to believe in belief.

Our beliefs lead our understanding and balance our explanations.

We hold our beliefs dear.

Returning to the 4E model, its enacted cognition elevates action over belief.

## 9. The Embedded

This is the final E in 4E. Embeddedness means we exist within our contexts and in relation to them, not as isolated elements. Not as "islands."

## 10. The Social

Materialism may seem to imply individualism. But our brains process socially. Even in the absence of people to talk to, the brain makes divisions within and negotiates as if multiple. Think of your internal dialog, Wilson in "Castaway," disassociative identity disorder, and Internal Family Systems therapy.

## 11. Connectionism

Further broadening, social cognition is made of connections. So is the microstructure of the brain, out to the abstract structure of your thoughts. Everything is connectionist.

These connections create an internal stability to the networks they make up--a structure that may not have a fundamental foundation that's "actually" holding it up.

## 12. The Illusion

Now for a wondrous thought. Does this mean there's nothing "actually" holding you up? Some traditions call the self an illusion. Too much? Maybe call it a direction: inward and forward. Too little? Then say it's a pruned and connected realm, bound in time to repetition by difference, making up an ongoing, constructed prediction that's never fully satisfied and can't be entirely understood from inside. Indeed no system can see its whole self from within, think of Goedel's famous paradox.

### 13. The Word

Does illusion mean pointless?  
Does it mean that as brains,  
we can't understand the  
brain? Perhaps. But the  
preceding isn't fact.  
Nothing of churning  
knowledge is total fact, nor  
absolute consensus, nor  
thudding conclusion.  
Here's another curious  
thought: written science  
is made of words.

"Consciousness," too, is  
merely a word which we  
connect to other words  
as pleases us.



## 14. The Critical

This is our last word.  
The great frontier of  
brain research today  
is the critical brain:  
the razor's edge  
between order and chaos.

Criticality is an  
energetic field that  
feels almost like magic.  
That's where I want to  
go. Come with me.  
You know where I'm coming  
from now. So let's go  
together.

Keep reading  
and meet me again,

Morgan Stern

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